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NASA Procedural Requirements

COMPLIANCE IS MANDATORY**NPR 7123.1**Effective Date: March 13,
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Subject: Systems Engineering Procedural Requirements

Responsible Office: Office of the Chief Engineer

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Appendix G. Technical Review Entrance and Success Criteria

This appendix describes the recommended best practices for technical reviews.

G.1 Mission Concept Review (MCR)

- a. The MCR will affirm the mission need and examine the proposed mission's objectives and the concept for meeting those objectives. It is an internal review that usually occurs at the cognizant organization for system development.
- b. The MCR should be completed prior to entering the concept development phase.
- c. Entrance Criteria. The MCR should include, for hardware and software system elements, availability of the products in Table G-1 to the cognizant participants prior to the review.
- d. Success Criteria. The review board was able to conclude that the success criteria in Table G-1 was accomplished to complete the objectives of the MCR.

Table G-1 - MCR Entrance and Success Criteria

Mission Concept Review	
Entrance Criteria	Success Criteria

<ol style="list-style-type: none"> 1. Mission goals and objectives. 2. Analysis of Alternative Concepts to show at least one is feasible. 3. Concept of Operations. 4. Preliminary mission descope options. 5. Preliminary risk assessment including technologies and associated risk management/mitigation strategies and options. 6. Conceptual test and evaluation strategy. 7. Preliminary technical plans to achieve next phase (preliminary SEMP). 8. Defined MOEs and MOPs. 9. Conceptual life-cycle support strategies (logistics, manufacturing, operation, etc.). 	<ol style="list-style-type: none"> 1. Mission objectives are clearly defined and stated and are unambiguous and internally consistent. 2. The preliminary set of requirements satisfactorily provides a system which will meet the mission objectives. 3. The mission is feasible. A solution has been identified which is technically feasible. A rough cost estimate is within an acceptable cost range. 4. The concept evaluation criteria to be used in candidate systems evaluation have been identified and prioritized. 5. The need for the mission has been clearly identified. 6. The cost and schedule estimates are credible. 7. A technical search was done to identify existing assets or products that could satisfy the mission or parts of the mission. 8. Technical planning is sufficient to proceed to the next phase. 9. Risk and mitigation strategies have been identified and are acceptable.
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G.2 System Requirements Review (SRR) and/or Mission Definition Review (MDR)

- a. The SRR and/or MDR examines the functional and performance requirements defined for the system and the preliminary program or project plan and ensures that the requirements and the selected concept will satisfy the mission.
- b. SRR and/or MDR is typically conducted during the concept development phase following completion of the concept studies phase, following baselining of the Systems Engineering Management Plan (SEMP) and before the preliminary design phase, the Agency Pre-Non-Advocate Review (PNAR), and System Definition Review (SDR).
- c. **Entrance Criteria.** Prior to the execution of the SRR and/orMDR the activities and products identified in Table G-2 should be completed and documentation provided to all participants prior to the review. Also, precursor reviews should be completed.
- d. **Success Criteria.** The review board was able to conclude that the success criteria in Table G-2 was accomplished to complete the objectives of the SRR and/or MDR.

Table G-2 - SRR and/or MDR Entrance and Success Criteria

System Requirements Review and/or Mission Definition Review	
Entrance Criteria	Success Criteria

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| <ol style="list-style-type: none"> 1. Successful completion of the MCR and responses made to all MCR Request for Actions (RFAs). 2. A preliminary SRR and/or MDR agenda, success criteria, and charge to the board have been agreed to by the technical team, project manager, and review chair prior to the SRR and/or MDR. 3. The following technical products for hardware and software system elements are available to the cognizant participants prior to the review: <ol style="list-style-type: none"> a. System Architecture. b. System requirements document. c. System software functionality description. d. Updated concept of operations. e. Updated mission requirements, if applicable. f. Baseline SEMP. g. Preliminary system requirements allocation to the next lower level system. h. Updated cost estimate. i. Technology Development Maturity Assessment Plan. j. Preferred system solution definition including major trades and options. k. Updated risk assessment and mitigations. l. Updated cost and schedule data. m. Logistics documentation (preliminary maintenance plan, etc.). n. Preliminary human rating plan, if applicable. o. Software Development Plan (SDP). p. System safety and mission assurance plan. q. Configuration management plan. r. Project management plan. s. Initial document tree. t. Verification and validation approach. | <ol style="list-style-type: none"> 1. The resulting overall concept is reasonable, feasible, complete, responsive to the mission requirements, and is consistent with system requirements and available resources (cost, schedule, mass power, etc.). 2. The project utilizes a sound process for the allocation and control of requirements throughout all levels, and a plan has been defined to complete the definition activity within schedule constraints. 3. Requirements definition is complete with respect to top level mission and science requirements, and interfaces with external entities and between major internal elements have been defined. 4. Requirements allocation and flow down of key driving requirements have been defined down to subsystems. 5. System and subsystem design approaches and operational concepts exist and are consistent with the requirements set. 6. The requirements, design approaches, and conceptual design will fulfill the mission needs within the estimated costs. 7. Preliminary approaches have been determined for how requirements will be verified and validated down to the subsystem level. 8. Major risks have been identified, and viable mitigation strategies have been defined. |
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| U. Preliminary hazard analysis (PHA).
V. Other specialty disciplines as required. |
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G.3 System Definition Review (SDR)

- a. The SDR examines the proposed system architecture/design and the flow down to all functional elements of the system.
- b. SDR is conducted early in the preliminary design phase, after the Pre-Non-Advocate Review (PNAR) and before the Preliminary Design Review (PDR).
- c. Entrance Criteria. Prior to the execution of the SDR, the activities and products identified in Table G-3 should be completed and documentation provided to all participants prior to the review. Also, precursor reviews should be completed.
- d. Success Criteria. The review board was able to conclude that the success criteria in Table G-3 was accomplished to complete the objectives of the SDR.

Table G-3 - SDR Entrance and Success Criteria

System Definition Review	
Entrance Criteria	Success Criteria

<ol style="list-style-type: none"> 1. Successful completion of the SRR/MDR and responses has been made to all SRR/MDR RFAs. 2. A preliminary SDR agenda, success criteria, and charge to the board have been agreed to by the technical team, project manager and review chair prior to the SDR. 3. SDR technical products listed below for both hardware and software system elements have been made available to the cognizant participants prior to the review: <ol style="list-style-type: none"> a. Updated baselined documentation, as required. b. Preliminary functional baseline (with supporting trade-off analyses and data). c. Preliminary system software functional requirements. d. SEMP changes, if any. e. Updated risk assessment and mitigations. f. Updated technology development, maturity, and assessment plan. g. Updated cost and schedule data. h. Updated logistics documentation. <ol style="list-style-type: none"> i. Based on system complexity, updated human rating plan. j. Software test plan. k. Software requirements document(s). l. Interface requirements documents (including software). m. Technical resource utilization estimates and margins. n. Updated safety and mission assurance (S&MA) Plan. o. Updated PHA. 	<ol style="list-style-type: none"> 1. Systems requirements including mission success criteria and any sponsor imposed constraints are defined, and form the basis for the proposed conceptual design. 2. All technical requirements are allocated, and the flow down to subsystems is adequate. The design definition is sufficient to support initial parametric and bottoms-up cost estimating. 3. The requirements process is sound and can reasonably be expected to continue to identify and flow detailed requirements in a manner timely for development. 4. The technical approach is credible and responsive to the identified requirements. 5. Technical plans have been updated, as necessary. 6. The trade-offs are completed and those planned for phase B adequately address the option space. 7. Significant development, mission, and safety risks are identified, and a risk process and resources exist to manage the risks. 8. Adequate planning exists for the development of any enabling new technology. 9. The operations concept is consistent with proposed design concept(s) and is in alignment with the mission requirements.
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G.4 Preliminary Design Review (PDR)

a. The Preliminary Design Review (PDR) demonstrates that the preliminary design meets all system requirements with acceptable risk and within the cost and schedule constraints and establishes the basis for proceeding with

detailed design. It will show that the correct design option has been selected, interfaces have been identified, and verification methods have been described.

b. PDR occurs near the completion of the preliminary design phase as the last review in the Formulation Phase and before the Agency Non-Advocate Review (NAR).

c. **Entrance Criteria.** Prior to the execution of the PDR the activities and products identified in Table G-4 should be completed and documentation provided to all participants prior to the review. Also, precursor reviews should be completed.

d. **Success Criteria.** The review board was able to conclude that the success criteria in Table G-4 was accomplished to complete the objectives of the PDR.

Table G-4 - PDR Entrance and Success Criteria

Preliminary Design Review	
Entrance Criteria	Success Criteria

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| <ol style="list-style-type: none"> 1. Successful completion of the SDR and responses has been made to all SDR RFAs, or a timely closure plan exists for those remaining open. 2. A preliminary PDR agenda, success criteria, and charge to the board have been agreed to by the technical team, project manager, and review chair prior to the PDR. 3. PDR technical products listed below for both hardware and software system elements have been made available to the cognizant participants prior to the review: <ol style="list-style-type: none"> a. Updated baselined documentation, as required. b. Preliminary subsystem design specifications for each configuration item (hardware and software), with supporting tradeoff analyses and data, as required. The preliminary software design specification needs to include a completed definition of the software architecture and a preliminary database design description as applicable. c. Updated technology development maturity assessment plan. d. Updated risk assessment and mitigation. e. Updated cost and schedule data. f. Updated logistics documentation, as required. g. Applicable technical plans (e.g., technical performance measurement plan, contamination control plan, parts management plan, environments control plan, EMI/EMC control plan, payload-to-carrier integration plan, producibility/manufacturability program plan, reliability program plan, quality assurance plan, etc.). h. Applicable standards. <ol style="list-style-type: none"> i. Safety analyses and plans. j. Engineering drawing tree. | <ol style="list-style-type: none"> 1. Agreement exists for the top-level requirements, including mission success criteria, TPMs, and any sponsor-imposed constraints, and that these are finalized, stated clearly, and are consistent with the preliminary design. 2. The flow down of verifiable requirements is complete and proper or, if not, an adequate plan exists for timely resolution of open items. Requirements are traceable to mission goals and objectives 3. The preliminary design is expected to meet the requirements at an acceptable level of risk. 4. Definition of the technical interfaces is consistent with the overall technical maturity and proves an acceptable level of risk. 5. Adequate technical interfaces are consistent with the overall technical maturity and provide an acceptable level of risk. 6. Adequate technical margins exist with respect to technical performances measures (TPMs) 7. Any required new technology has been developed to an adequate state of readiness, or back-up option exist and are supported to make them a viable alternative. 8. The project risks are understood, and plans and a process and resources exist to effectively manage them. 9. Safety and mission assurance (i.e., safety, reliability, maintainability, quality, and |
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<ul style="list-style-type: none"> k. Interface control documents. l. Verification/validation plan. m. Plans to respond to regulatory requirements (e.g., Environmental Impact Statement), as required. n. Disposal plan. o. Technical resource utilization estimates and margins. p. System-level hazard analysis. q. Preliminary limited life items list (LLIL). 	<p>adequately addressed in preliminary designs and any applicable S&MA products (i.e., hazard analysis and failure modes and effects analysis) have been approved.</p> <p>10. The operational concept is technically sound, that it includes (where appropriate) human factors that apply, and that requirements for its execution flow down.</p>
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G.5 Critical Design Review (CDR)

- a. The purpose of the CDR is to demonstrate that the maturity of the design is appropriate to support proceeding with full scale fabrication, assembly, integration, and test, and that the technical effort is on track to complete the flight and ground system development and mission operations in order to meet mission performance requirements within the identified cost and schedule constraints.
- b. CDR occurs near the completion of the final design phase and always before entering the fabrication, assembly, and test phase.
- c. Entrance Criteria. Prior to the execution of the CDR, the activities and products identified in Table G-5 should be completed and documentation provided to all participants prior to the review. Also, precursor reviews should be completed.
- d. Success Criteria. The review board was able to conclude that the success criteria in Table G-5 was accomplished to complete the objectives of the CDR.

Table G-5 - CDR Entrance and Success Criteria

Critical Design Review	
Entrance Criteria	Success Criteria

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| <ol style="list-style-type: none"> 1. Successful completion of the PDR and responses has been made to all PDR RFAs, or a timely closure plan exists for those remaining open. 2. A preliminary CDR agenda, success criteria, and charge to the board have been agreed to by the technical team, project manager and review chair prior to the CDR. 3. CDR technical products listed below for both hardware and software system elements have been made available to the cognizant participants prior to the review: <ol style="list-style-type: none"> a. Updated baselined documents, as required. b. Product build-to specifications for each hardware and software configuration item, along with supporting trade-off analyses and data. c. Fabrication, assembly, integration, and test plans and procedures. d. Technical Data Package (e.g., Integrated Schematics, Spares Provisioning List, Interface Control Documents, engineering analyses, specifications, etc.). e. Operational Limits and Constraints. f. Technical Resource Utilization estimates and margins. g. Acceptance Criteria. h. Command and Telemetry List. i. Verification Plan (including requirements and specification). j. Validation Plan. k. Launch Site Operations Plan. l. Checkout and Activation Plan. m. Disposal Plan (including decommissioning or termination). n. Updated Technology Development Maturity Assessment Plan. o. Updated risk assessment and mitigation. | <ol style="list-style-type: none"> 1. The detailed design is expected to meet the requirements with adequate margins at an acceptable level of risk. 2. Interface control documents are appropriately matured to proceed with fabrication, assembly, integration and test, and plans are in place to manage any open items 3. High confidence exists in the product baseline, and adequate documentation exists and/or will exist in a timely manner to allow proceeding with fabrication, assembly, integration, and test. 4. The product verification and product validation requirements and plans are complete. 5. The testing approach is comprehensive, and the planning for system assembly, integration, test, and launch site and mission operations is sufficient to progress into the next phase. 6. Adequate technical and programmatic margins and resources exist to complete the development within budget, schedule, and risk constraints. 7. Risks to mission success are understood, and plans and resources exist to effectively manage them. 8. Safety and mission assurance (i.e., safety, reliability, maintainability, quality, and EEE parts) have been adequately addressed in system and operational designs and any applicable S&MA products (i.e., hazard analysis and failure modes |
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<p>p. Updated cost and schedule data.</p> <p>q. Updated logistics documentation.</p> <p>r. Software Design Document(s) (including Interface Design Documents).</p> <p>s. Updated LLIL.</p> <p>t. Subsystem-level and preliminary operations hazards analyses.</p> <p>u. Systems and subsystem certification plans and requirements (as needed).</p> <p>v. System hazard analysis with associated verifications.</p>	<p>and effects analysis) have been approved.</p>
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G.6 Test Readiness Review (TRR)

- a. A TRR ensures that the test article (hardware/software), test facility, support personnel, and test procedures are ready for testing and data acquisition, reduction, and control.
- b. A TRR is held prior to commencement of verification testing.
- c. Entrance Criteria. Prior to the execution of a TRR, the activities and products identified in Table G-6 should be completed and documentation provided to all participants prior to the review.
- d. Success Criteria. The review board was able to conclude that the success criteria in Table G-6 was accomplished to complete the objectives of a TRR.

Table G-6 - TRR Entrance and Success Criteria

Test Readiness Review	
Entrance Criteria	Success Criteria

<ol style="list-style-type: none"> 1. The objectives of the testing have been clearly defined and documented and that all of the test plans, procedures, environment, and the configuration of the test item support those objectives. 2. Configuration of system under test has been defined and agreed to. All interfaces have been placed under configuration management or have been defined in accordance with an agreed to plan, and a version description document has been made available to TRR participants prior to the review. 3. All applicable functional, unit level, subsystem, system, and qualification testing has been conducted successfully. 4. All TRR specific materials such as test plans, test cases, and procedures have been available to all participants prior to conducting the review. 5. All known system discrepancies have been identified and dispositioned in accordance with an agreed upon plan. 6. All previous design review success criteria and key issues have been satisfied in accordance with an agreed upon plan. 7. All required test resources (people (including a designated test director) facilities, test articles, test instrumentation) have been identified and are available to support required tests. 8. Roles and responsibilities of all test participants are defined and agreed to. 9. Test contingency planning has been accomplished, and all personnel have been trained. 	<ol style="list-style-type: none"> 1. Adequate test plans are completed and approved for the system under test. 2. Adequate identification and coordination of required test resources is completed 3. Previous component, subsystem, system test results form a satisfactory basis for proceeding into planned tests. 4. Risk level is identified and accepted by program/competency leadership as required. 5. Plan to capture any lessons learned from the test program 6. The objectives of the testing have been clearly defined and documented, and the review of all the test plans, as well as the procedures, environment, and the configuration of the test item, provide a reasonable expectation that the objectives will be met 7. The test cases have been reviewed and analyzed for expected results and the results are consistent with the test plans and objectives 8. Test personnel have received appropriate training in test operation and safety procedures.
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G.7 Systems Acceptance Review (SAR)

- a. The purpose of the SAR is to verify the completeness of the specific end item with respect to the expected maturity level and to assess compliance to stakeholder expectations. The SAR examines the system, its end items and documentation, and test data and analyses that support verification. It also ensures that the system has sufficient technical maturity to authorize its shipment to the designated operational facility or launch site.
- b. The SAR is held late in the fabrication, assembly, integration, and test phase.
- c. Entrance Criteria. Prior to the execution of the SAR, the activities and products identified in Table G-7 should be completed and documentation provided to all participants prior to the review.

d. Success Criteria. The review board was able to conclude that the success criteria in Table G-7 was accomplished to complete the objectives of the SAR.

Table G-7 - SAR Entrance and Success Criteria

System Acceptance Review	
Entrance Criteria	Success Criteria
<ol style="list-style-type: none"> 1. A preliminary agenda has been coordinated (nominally) prior to the SAR. 2. The following SAR technical products have been made available to the cognizant participants prior to the review: <ol style="list-style-type: none"> a. Results of the SARs conducted at the major suppliers. b. Transition to production and/or manufacturing plan. c. Documentation that the delivered system complies with the established acceptance criteria. d. Documentation that the system will perform properly in the expected operational environment. e. Technical data package as updated to include all test results. f. Certification package. g. Updated risk assessment and mitigation. h. Previous milestone reviews have been successfully completed. i. Remaining liens or unclosed actions and plans for closure. 	<ol style="list-style-type: none"> 1. Required tests and analyses are complete and indicate that the system will perform properly in the expected operational environment. 2. Risks are known and manageable. 3. System meets the established acceptance criteria. 4. Required shipping, handling, checkout, and operational plans and procedures are complete and ready for use. 5. Technical data package is complete and reflects the delivered system. 6. All applicable lessons learned for organizational improvement and system operations are captured.

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G.8 Flight Readiness Review (FRR)

a. The FRR examines tests, demonstrations, analyses, and audits that determine the system's readiness for a safe and successful flight/launch and for subsequent flight operations. It also ensures that all flight and ground hardware, software, personnel, and procedures are operationally ready.

b. The FRR is held after the system has been configured for flight.

c. Entrance Criteria. Prior to the execution of the FRR, the activities and products identified in Table G-8 should be completed and documentation provided to all participants prior to the review.

d. Success Criteria. The review board was able to conclude that the success criteria in Table G-8 was accomplished to complete the objectives of the FRR:

Table G-8 - FRR Entrance and Success Criteria

Flight Readiness Review

Entrance Criteria	Success Criteria
<ol style="list-style-type: none"> 1. Receive certification that flight operations can safely proceed with acceptable risk. 2. Confirm that the system and support elements are properly configured and ready for flight. 3. Establish that all interfaces are compatible and function as expected. 4. Establish that the system state supports a launch "go" decision based on go/no-go criteria.> 	<ol style="list-style-type: none"> 1. The flight vehicle is ready for flight. 2. The hardware is ready for a safe flight with a high probability for achieving mission success. 3. Flight and ground software elements are ready to support flight and flight operations. 4. Interfaces are checked out and found to be functional. 5. Open items and waivers have been examined and found to be acceptable. 6. The flight and recovery environmental factors are within constraints. 7. All open safety and mission risk items have been addressed.

G.9 Operational Readiness Review (ORR)

- a. The ORR examines the actual system characteristics and the procedures used in the system or product's operation and ensures that all system and support (flight and ground) hardware, software, personnel, procedures, and user documentation accurately reflects the deployed state of the system.
- b. The ORR is held at the end of Phase D.
- c. Entrance Criteria. Prior to the execution of the ORR, the activities and products identified in Table G-9 should be completed and documentation provided to all participants prior to the review.
- d. Success Criteria. The review board was able to conclude that the success criteria in Table G-9 was accomplished to complete the objectives of the ORR.

Table G-9 - ORR Entrance and Success Criteria

Operational Readiness Review	
Entrance Criteria	Success Criteria

<ol style="list-style-type: none"> 1. All validation testing has been completed. 2. Test failures and anomalies from validation testing have been resolved and the results incorporated into all supporting and enabling operational products. 3. All operational supporting and enabling products (facilities, equipment, documents, updated databases, etc) that are necessary for the nominal and contingency operations have been tested and delivered/installed at the site(s) necessary to support operations. 4. Training has been provided to the users and operators on the correct operational procedures for the system. 5. Operational contingency planning has been accomplished, and all personnel have been trained. 	<ol style="list-style-type: none"> 1. The system including any enabling products is determined to be ready to be placed in an operational status. 2. All applicable lessons learned for organizational improvement and systems operations have been captured. 3. All waivers and anomalies have been closed. 4. Systems hardware, software, personnel, and procedures are in place to support operations.
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G.10 Periodic Technical Review (PTR)

Science and technology development conducted by NASA in BAR, ATD, and IP programs and projects may not be conducted along the same rigorous processes and schedules as FS&GS programs. Depending on the scope and technology readiness level (TRL) of these projects, a streamlined review system may be appropriate. (See NPR 7120.5 for a definition of TRL.) Sound engineering of processes defined in this SE NPR should be applied and reviewed when appropriate. A PTR review schedule with well-defined review entrance and success criteria should be developed in project formulation. Success criteria should ascertain whether sufficient technical maturity has been achieved to support a management decision to proceed to the next phase. In some cases, such as high TRL development efforts, a subset of FS&GS reviews is appropriate (e.g., SRR, PDR, CDR, SAR). PTRs should include both internal and independent external reviewers. Finding and actions from each PRT should be disseminated and resolved after each review.

G.11 Decommissioning Review (DR)

- a. The purpose of the DR is to confirm the decision to terminate or decommission the system and assess the readiness for the safe decommissioning and disposal of system assets.
- b. The DR is normally held near the end of routine mission operations upon accomplishment of planned mission objectives. It may be advanced if some unplanned event gives rise to a need to prematurely terminate the mission, or delayed if operational life is extended to permit additional investigations.
- c. Entrance Criteria. Prior to the execution of the DR, the activities and products identified in Table G-10 should be completed and documentation provided to all participants prior to the review.
- d. Success Criteria. The review board was able to conclude that the success criteria in Table G-10 was accomplished to complete the objectives of the DR.

Table G-10 - DR Entrance and Success Criteria

Decommissioning Review	
Entrance Criteria	Success Criteria

<ol style="list-style-type: none"> 1. Requirements associated with decommissioning and disposal. 2. Plans for decommissioning, disposal, and any other removal from service activities. 3. Resources in place to support decommissioning and disposal activities, plans for disposition of project assets, and archival of essential mission and project data. 4. Description of safety, environmental and any other constraints. 5. Description of the current system capabilities. 6. For off-nominal operations, description of all contributing events, conditions, and changes to the originally expected baseline. 	<ol style="list-style-type: none"> 1. The reasons for decommissioning disposal are documented. 2. The decommissioning and disposal plan is complete, approved by appropriate management, disposal plan is complete, compliant with applicable Agency safety, environmental, and health regulations. Operations plans for all potential scenarios, including contingencies, are complete and approved. All required support systems are available. 3. All personnel have been properly trained for the nominal and contingency procedures. 4. Safety, health, and environmental hazards have been identified. Controls have been verified. 5. Risks associated with the disposal have been identified and adequately mitigated. Residual risks have been accepted by the required management. 6. If hardware is to be recovered from orbit: <ol style="list-style-type: none"> a. Return site activity plans have been defined and approved. b. Required facilities are available and meet requirements, including those for contamination control, if needed. c. Transportation plans are defined and approved. Shipping containers and handling equipment, as well as contamination and environmental control and monitoring devices, are available. 7. Plans for disposition of mission-owned assets (hardware, software, facilities, etc.) have been defined and approved. 8. Plans for archival and subsequent analysis of mission data have been defined and approved. Arrangements have been finalized for the execution of such plans. Plans for the capture and dissemination of appropriate lessons learned during the project life cycle have been defined and approved. Adequate resources (schedule, budget, and staffing) have been identified and are available to successfully complete all decommissioning, disposal, and disposition activities.
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G.12 Technical Peer Reviews

- a. Peer reviews provide the technical insight essential to ensure product and process quality. Peer reviews are

focused, in-depth technical reviews that support the evolving design and development of a product, including critical documentation or data packages. They are often, but not always, held as supporting reviews for technical reviews such as PDR and CDR. A purpose of the peer review is to add value and reduce risk through expert knowledge, infusion, confirmation of approach, identification of defects, and specific suggestions for product improvements.

b. The results of the engineering peer reviews (EPRs) comprise a key element of the review process. The results and issues that surface during these reviews are documented and reported out at the appropriate next higher element level.

c. The peer reviewers should be selected from outside the project, but they should have a similar technical background, and they should be selected for their skill and experience. Peer reviewers should be selected to have as their only concern the technical integrity and quality of the product. Peer reviews should be kept simple and informal. They should concentrate on a review of the documentation and minimize the viewgraph presentations. A "round-table" format rather than a stand-up presentation is preferred. The peer reviews should give the full technical picture of items being reviewed.

d. Technical depth should be to a level that allows the review team to gain insight into the technical risks. Rules need to be established to ensure consistency in the peer review process. At the conclusion of the review, a report on the findings and actions must be distributed.

e. Peer reviews must be part of the contract for those projects where systems engineering is done out-of-house.

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